284. (Six Times Amended) A process for detecting a nucleic acid of interest in a sample, which process comprises the steps of:

(a) hybridizing said nucleic acid of interest in the sample with one or more oligo- or polynucleotides, each such oligo- or polynucleotide being complementary to or capable of hybridizing with said nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one nucleotide selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine and such covalent attachment does not substantially interfere with double helix formation or nucleic acid hybridization;

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

said PM being attached to the furanose moiety SM at a position independently selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, said BASE being attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group and such covalent attachment does not substantially interfere with double helix formation or nucleic acid hybridization; and

(iii) a nucleotide having the formula

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine, and Sig is covalently attached to PM and such covalent attachment does not substantially interfere with double helix formation or nucleic acid hybridization; and

D3, cont'd

(b) detecting the presence of said detectable Sig moieties in any of the oligo- or polynucleotides which have hybridized to said nucleic acid of interest.

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331. (Four Times Amended) The process according to claims 329 or 373, wherein said modified nucleotide or nucleotides comprise a member selected from the group consisting of:

D4

(i) a nucleotide having the formula

PM–SM–BASE–Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety.

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

said PM being attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination

thereof, said BASE being attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group; and

(iii) a nucleotide having the formula

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety,

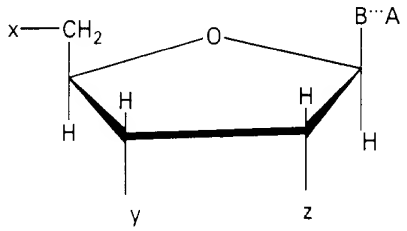
SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine, and Sig is covalently attached to PM.

332. (Four Times Amended) The process according to claims 329 or 373, wherein said modified nucleotide or nucleotides have the structure:



wherein B represents a purine, a 7-deazapurine or a pyrimidine moiety suitable for incorporation into a polynucleotide and covalently bonded to the C^1 -position of the furanose moiety, provided that when B is a purine or 7-deazapurine, the furanose moiety is attached at the [N^9] N9 position of the purine or deazapurine, and when B is

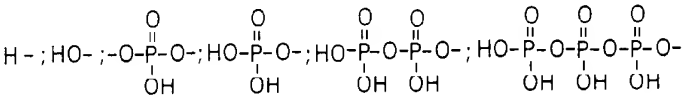
a pyrimidine, the furanose moiety is attached at the N^1 position of the pyrimidine;

wherein A represents at least three carbon atoms and is an indicator molecule that is self-indicating;

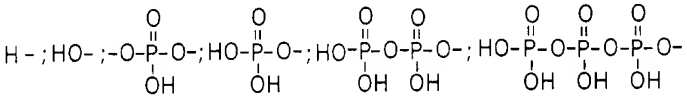
wherein B and A are covalently attached directly or through a linkage group, said linkage group not interfering substantially with detection of A;

wherein if B is a purine, A is attached to the 8-position of the purine, if B is a 7-deazapurine, A is attached to the 7-position of the deazapurine, and if B is a pyrimidine, A is attached to the 5-position of the pyrimidine; and

wherein x comprises a member selected from the group consisting of:



wherein y comprises a member selected from the group consisting of:



wherein z comprises a member selected from the group consisting of H– and HO–.

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337. (Six Times Amended) A process for preparing a labeled oligo- or polynucleotide of interest, comprising the steps of:

(A) providing either:

(1) one or more chemically modified nucleotides capable of incorporating into an oligo- or polynucleotide of interest, alone or in conjunction with one or more other modified or unmodified nucleic acids selected from the group consisting of nucleotides, oligonucleotides and polynucleotides, said other modified or unmodified nucleic acids being capable of incorporating into an oligo- or polynucleotide of interest, said chemical modification comprising a label capable of providing directly or

indirectly a detectable signal indicating the presence of said labeled oligo- or polynucleotide of interest, or

(2) an oligo- or polynucleotide of interest comprising one or more chemically modified nucleotides, alone or in conjunction with one or more other modified or unmodified nucleic acids selected from the group consisting of nucleotides, oligonucleotides and polynucleotides, said chemical modification comprising a label capable of providing directly or indirectly a detectable signal indicating the presence of said labeled oligo- or polynucleotide of interest,

said chemically modified nucleotides being modified on the sugar, phosphate or base moieties thereof and being selected from the group consisting of:

(i)

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety, and

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE directly or through a linkage group at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

(ii)

Sig
|
PM—SM—BASE

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety, and

wherein said PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, said BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group; and

D5 cont'd

(iii)

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety; and

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM directly or through a linkage group; and

said oligo- or polynucleotide of interest; and

(B) either incorporating said one or more modified nucleotides (1) into said oligo- or polynucleotide, thereby preparing a labeled oligo- or polynucleotide of interest, or preparing said oligo- or polynucleotide of interest from said oligo- or polynucleotide recited in step (A)(2) above.

348. (Five Times Amended) A process for determining in a sequencing gel the presence of nucleic acid fragments complementary to a nucleic acid of interest or a portion thereof, said process comprising the steps of:

(A) providing:

one or more chemically modified nucleotides capable of incorporating into a nucleic acid, alone or in conjunction with one or more other modified or unmodified nucleic acids selected from the group consisting of nucleotides, oligonucleotides and polynucleotides, said other modified or unmodified nucleic acids being capable of incorporating into or forming one or more nucleic acid fragments, each fragment being complementary to said nucleic acid of interest or to a portion thereof, said chemical modification rendering said one or more chemically modified nucleotides either:

(I) self-indicating; or

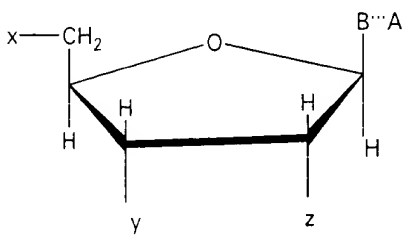
(II) comprising a label capable of providing directly or indirectly a detectable signal;

said self-indicating chemical modification or said label indicating the presence of said labeled nucleic acids or nucleic acid fragments;

said chemically modified nucleotides being modified non-disruptively or disruptively on at least one of the sugar, phosphate or base moieties thereof; and;

(B) incorporating said one or more chemically modified nucleotides into said one or more fragments, thereby preparing labeled fragments, each such fragment being complementary to said nucleic acid of interest or to a portion thereof, said labeled fragments comprising one or more chemically modified nucleotides selected from the group consisting of:

(i)



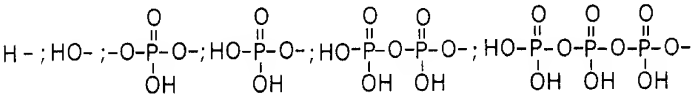
wherein B represents a purine, a 7-deazapurine or a pyrimidine moiety covalently bonded to the C1'-position of the sugar moiety, provided that whenever B is a purine or 7-deazapurine, the sugar moiety is attached at the

N9 [-] position of the purine or 7-deazapurine, and whenever B is a pyrimidine, the sugar moiety is attached at the N1 [-] position of the pyrimidine;

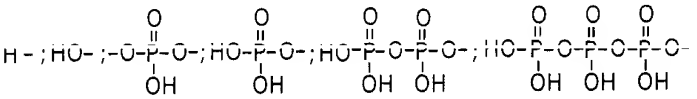
wherein A comprises at least three carbon atoms and represents at least one component of a signalling moiety capable of producing directly or indirectly a detectable signal or being self-indicating; and

wherein B and A are covalently attached directly or through a linkage group, and

wherein x comprises a member selected from the group consisting of:

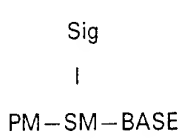


wherein y comprises a member selected from the group consisting of:



wherein z comprises a member selected from the group consisting of H- and HO- ;

(ii)



wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety or is self-indicating, and

wherein said PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, said BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group; and

(iii)

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety or is self-indicating; and

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM directly or through a linkage group;

(C) transferring or subjecting said labeled fragments to a sequencing gel;

(D) separating or resolving said labeled fragments; and

(E) detecting directly or indirectly the presence of said labeled fragments.

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376. (Twice Amended) A process for determining whether the number of copies of a particular chromosome in a cell is normal or abnormal, the process comprising the steps of:

contacting said cell under hybridizing conditions with one or more clones or DNA fragments or oligo- or polynucleotides derived from said clone or clones, each of which is capable of hybridizing specifically to a locus or loci of said particular chromosome or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

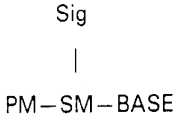
BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

D1 cont

(ii) a nucleotide having the formula



wherein

PM is a phosphate moiety,

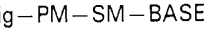
SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached SM directly or through a linkage group; and

(iii) a nucleotide having the formula



wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at position selected from the group consisting of the 2', the 3' and the 5' position, or any combination

thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM,

to permit hybridization of said clone or clones or DNA fragments or oligo- or [polynucleotide] polynucleotides to the locus or loci of said particular chromosome;

detecting the signal generated by said hybridized clone or clones or DNA fragments or oligo- or [polynucleotide] polynucleotides, thereby determining the number of copies of said particular chromosome; and

comparing said determined number of copies of said particular chromosome with a number of copies of said particular chromosome determined for a normal cell containing said particular chromosome, thereby determining whether the number of copies of said particular chromosome in said cell is abnormal.

377. (Twice Amended) The process of claim 376, wherein said one or more [oligo- or polynucleotides comprise a clone or] clones or DNA fragments or oligo- or polynucleotides derived from clone or clones are derived from said particular chromosome.

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381. (Twice Amended) A process for identifying a chromosome of interest in a cell containing other chromosomes, the process comprising the steps of:

providing a set of clones or DNA fragments or oligo- or polynucleotides derived from said clone or clones, each of which is specifically hybridizable to a locus or loci in said chromosome of interest, each of said oligo- or polynucleotides comprising at least one modified nucleotide selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any

combination thereof, BASE is attached to the 1' position of SM from the [N^1] position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

D8 cont

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

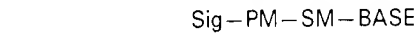
SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached SM directly or through a linkage group; and

(iii) a nucleotide having the formula



wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1]

N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM;

fixing the chromosomes from or in said cell;

contacting said fixed chromosomes under hybridizing conditions with said set of clones or DNA fragments or oligo- or polynucleotides, permitting hybridization of said set of clones or DNA fragments or oligo- or polynucleotides to said locus or loci in said chromosome of interest;

detecting any signal generated by each of said clones or DNA fragments or oligo- or polynucleotides which have hybridized to said locus or loci in said chromosome of interest, thereby obtaining a pattern of hybridizations between said set of clones or DNA fragments or oligo- or polynucleotides and said chromosomes; and

identifying said chromosome of interest by means of said hybridization pattern obtained.

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385. (Twice Amended) A process for identifying a plurality or all of the chromosomes in a cell of interest, the process comprising the steps of:

providing sets of clones or DNA fragments or oligo- or polynucleotides derived from said clones, each of said set of clones or DNA fragments or oligo- or polynucleotides being specifically hybridizable to a locus or loci in a chromosome of said cell of interest, each of said clones or DNA fragments or oligo- or polynucleotides in said sets being labeled with a different indicator molecule and each of said clones or DNA fragments or oligo- or polynucleotides comprising at least one modified nucleotide selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any

combination thereof, BASE is attached to the 1' position of SM from the [N^1] position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

D9 cont

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached SM directly or through a linkage group; and

(iii) a nucleotide having the formula

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1]

N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM;

D9 cancel

fixing the chromosomes from or in said cell;

contacting said fixed chromosomes under hybridizing conditions with said sets of clones or DNA fragments or oligo- or polynucleotides, thereby permitting hybridization of said sets of clones or DNA fragments or oligo- or polynucleotides to the locus or loci in said chromosomes; and

detecting any signal generated by each of said different indicator molecules in said sets of clones or DNA fragments or oligo- or polynucleotides which have hybridized to the locus or loci in said chromosomes, thereby identifying any one of the chromosomes in said cell of interest.

D10

386. (Amended) The process of claim 385, wherein each of said set of clones or DNA fragments or oligo- or polynucleotides is labeled with the same indicator molecule.

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390. (Twice Amended) A process for determining the number of chromosomes in an interphase cell of interest, the process comprising the steps of:

D11

providing sets of clones or DNA fragments or oligo- or polynucleotides derived from said clones, each of said set of clones or DNA fragments or oligo- or polynucleotides being specifically complementary to or specifically hybridizable with at least one locus or loci in a chromosome of said interphase cell of interest and each of said clones or DNA fragments or oligo- or polynucleotides in said sets comprising at least one modified nucleotide selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached SM directly or through a linkage group; and

(iii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any

combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is purine, and Sig is covalently attached to PM;

D11 cancel

contacting said interphase cell under hybridizing conditions with said sets of clones or DNA fragments or oligo- or polynucleotides, thereby permitting hybridization of said sets of clones or DNA fragments or oligo- or polynucleotides to any of the locus or loci in said chromosomes;

detecting any signals generated by each of said sets of clones or DNA fragments or oligo- or polynucleotides hybridized to the locus or loci in said chromosomes, to obtain a pattern of generated signals; and

comparing each generated signal with other generated signals in said pattern, thereby determining the number of chromosomes in said interphase cell of interest.

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391. (Amended) The process of claim 390, wherein each of said sets of clones or DNA fragments or oligo- or polynucleotides is labeled with the same indicator molecule.

D12

392. (Amended) The process of claim 390, wherein each of said sets of clones or DNA fragments or oligo- or polynucleotides is labeled with a different indicator molecule.

D13

513. (Amended) The process according to claim 284, wherein said nucleic acid of interest [comprises] is derived from a member selected from the group consisting of *Streptococcus pyrogenes*, *Neisseria meningitidis*, *Staphylococcus aureus*, *Candida albicans*, *Pseudomonas aeruginosa*, *Neisseria gonorrhoeae*, *Mycobacterium tuberculosis*, and any combinations of the foregoing.

514. (Amended) The process according to claim 284, wherein said one or more oligo- or polynucleotides [comprise] are derived from a member selected [or derived] from the group consisting of *Streptococcus pyrogenes*, *Neisseria meningitidis*, *Staphylococcus aureus*, *Candida albicans*, *Pseudomonas aeruginosa*, *Neisseria gonorrhoeae*, *Mycobacterium tuberculosis*, and any combinations of the foregoing.

A13 cont

515. (Amended) The process according to claim 337, wherein said labeled oligo- or polynucleotide of interest [comprises] are derived from a member selected [or derived] from the group consisting of *Streptococcus pyrogenes*, *Neisseria meningitidis*, *Staphylococcus aureus*, *Candida albicans*, *Pseudomonas aeruginosa*, *Neisseria gonorrhoeae*, *Mycobacterium tuberculosis*, and any combinations of the foregoing.

516. (Amended) The process according to claim 396, wherein said nucleic acid of interest [comprises] are derived from a member selected [or derived] from the group consisting of *Streptococcus pyrogenes*, *Neisseria meningitidis*, *Staphylococcus aureus*, *Candida albicans*, *Pseudomonas aeruginosa*, *Neisseria gonorrhoeae*, *Mycobacterium tuberculosis*, and any combinations of the foregoing.

517. (Amended) The process according to claim 513, wherein said nucleic acid of interest [comprises] is derived from *Neisseria gonorrhoeae*.

518. (Amended) The process according to claim 514, wherein said one or more oligo- or polynucleotides [comprise] are derived from *Neisseria gonorrhoeae*.

522. (Amended) The process according to claims 520 or 521, wherein said modified nucleotide or nucleotides comprise a member selected from the group consisting of:

(i) a nucleotide having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine 7-deazapurine, and

Sig is a detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or a 7-deazapurine, and Sig is covalently attached to BASE at a position other than the [C^5] C5 position when BASE is a pyrimidine, at a position other than the [C^8] C8 position when BASE is a purine, and at a position other than the [C^7] C7 position when BASE is a 7-deazapurine;

(ii) a nucleotide having the formula

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

said PM being attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, said BASE being attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group; and

(iii) a nucleotide having the formula

Sig—PM—SM—BASE

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine, and Sig is covalently attached to PM.

D14 cont

523. (Amended) The process according to claims 329, 373, 520 or 521, wherein said modified nucleotide or nucleotides have the formula:

wherein

PM is a phosphate moiety,

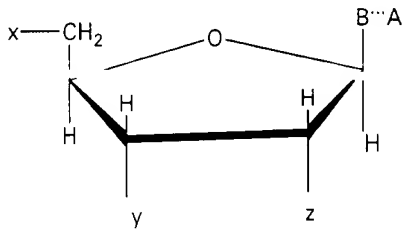
SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is a detectable moiety,

said PM being attached to the furanose moiety SM at a position selected from the group consisting of the 2', 3', and 5' positions, or any combination thereof, said BASE being attached to the 1' position of SM from the [N^1] N1 position when BASE is a pyrimidine or the [N^9] N9 position when BASE is a purine or 7-deazapurine, and Sig is covalently attached to SM directly or through a linkage group[; and] .

524. (Amended) The process according to claims 520 or 521, wherein said modified nucleotide or nucleotides have the structure:



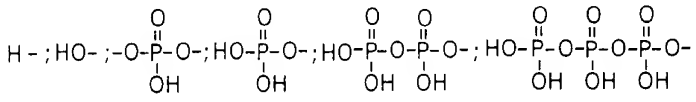
wherein B represents a purine, a 7-deazapurine or a pyrimidine moiety suitable for incorporation into a polynucleotide and covalently bonded to the C^1-position of the furanose moiety, provided that when B is a purine or 7-deazapurine, the furanose moiety is attached at the [N^9] N9 position of the purine or deazapurine, and when B is a pyrimidine, the furanose moiety is attached at the [N^1] N1 position of the pyrimidine;

wherein A represents at least three carbon atoms and is an indicator molecule that is self-indicating;

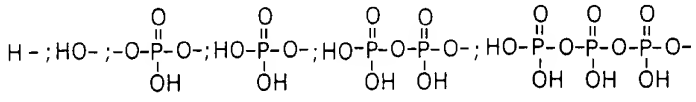
wherein B and A are covalently attached directly or through a linkage group, said linkage group not interfering substantially with detection of A;

wherein if B is a purine, A is attached to the 8-position of the purine, if B is a 7-deazapurine, A is attached to the 7-position of the deazapurine, and if B is a pyrimidine, A is attached to the 5-position of the pyrimidine; and

wherein x comprises a member selected from the group consisting of:



wherein y comprises a member selected from the group consisting of:



D14, Concld

wherein z comprises a member selected from the group consisting of H– and HO–.

D15

526. (Amended) The process according to claims 520 or 521, wherein said nucleic acid of interest [comprises or] is derived from *Neisseria gonorrhoeae*.

Add new claims 530-568 as follows:

-- 530. (NEW) The process according to claims 329, 373, 520 or 521, wherein modified nucleotide or nucleotides have the formula

Sig—PM—SM—BASE

D16

wherein

PM is a phosphate moiety,

SM is a furanose moiety,

BASE is a pyrimidine, purine or 7-deazapurine, and

Sig is detectable moiety,

wherein PM is attached to the furanose moiety SM at a position selected from the group consisting of the 2', the 3' and the 5' position, or any combination thereof, BASE is attached to the 1' position of SM from the N1 position when BASE is a pyrimidine or the N9 position when BASE is a purine, and Sig is covalently attached to PM. --

-- 531. (NEW) The process according to claim 284, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least three carbon atoms and at least one double bond. --

-- 532. (NEW) The process according to claim 284, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least four carbon atoms. --

-- 533. (NEW) The process according to claim 284, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least five carbon atoms. --

D10 cont

-- 534. (NEW) The process according to claim 284, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least six carbon atoms. --

-- 535. (NEW) The process according to claim 284, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position when BASE is a pyrimidine that is selected from the group consisting of the C2 position, the N3 position, the C6 position, and combinations thereof, or is covalently attached to BASE at a position when BASE is a purine that is selected from the group consisting of the N1 position, the C2 position, the N3 position, the C6 position, the N7 position, and combinations thereof. --

-- 536. (NEW) The process according to claim 284, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position selected from the group consisting of the N^4 position when said pyrimidine comprises cytosine, the N^2 position when said purine comprises adenine or deazaadenine, the N^6 position when said purine comprises guanine or deazaguanine, and combinations thereof. --

-- 537. (NEW) The process according to claim 331, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least three carbon atoms and at least one double bond. --

-- 538. (NEW) The process according to claim 331, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least four carbon atoms. --

-- 539. (NEW) The process according to claim 331, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least five carbon atoms. --

D 16 cont

-- 540. (NEW) The process according to claim 331, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 541. (NEW) The process according to claim 331, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least six carbon atoms. --

-- 542. (NEW) The process according to claim 541, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 543. (NEW) The process according to claim 331, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position when BASE is a pyrimidine that is selected from the group consisting of the C2 position, the N3 position, the C6 position, and combinations thereof, or is covalently attached to BASE at a position when BASE is a purine that is selected from the group consisting of the N1 position, the C2 position, the N3 position, the C6 position, the N7 position, and combinations thereof. --

-- 544. (NEW) The process according to claim 331, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position selected from the group consisting of the N^4 position when said pyrimidine comprises cytosine, the N^2 position when said purine comprises adenine or deazaadenine, the N^6 position when said purine comprises guanine or deazaguanine, and combinations thereof. --

-- 545. (NEW) The process according to claim 337, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least three carbon atoms and at least one double bond. --

Q16 cont

-- 546. (NEW) The process according to claim 337, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least four carbon atoms. --

-- 547. (NEW) The process according to claim 337, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least five carbon atoms. --

-- 548. (NEW) The process according to claim 547, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 549. (NEW) The process according to claim 337, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least six carbon atoms. --

-- 550. (NEW) The process according to claim 549, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 551. (NEW) The process according to claim 337, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position when BASE is a pyrimidine that is selected from the group consisting of the C2 position, the N3 position, the C6 position, and combinations thereof, or is covalently attached to BASE at a position when BASE is a purine that is selected from the group consisting of the N1 position, the C2 position, the N3 position, the C6 position, the N7 position, and combinations thereof. --

-- 552. (NEW) The process according to claim 337, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position selected from the group consisting of the N^4 position when said pyrimidine comprises cytosine, the N^2 position when said purine comprises adenine or deazaadenine, the N^6 position when said purine comprises guanine or deazaguanine, and combinations thereof. --

-- 553. (NEW) The process according to claim 348, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least three carbon atoms and at least one double bond. --

-- 554. (NEW) The process according to claim 348, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least four carbon atoms. --

-- 555. (NEW) The process according to claim 348, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least five carbon atoms. --

-- 556. (NEW) The process according to claim 555, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 557. (NEW) The process according to claim 348, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least six carbon atoms. --

-- 558. (NEW) The process according to claim 557, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 559. (NEW) The process according to claim 348, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position when BASE is a pyrimidine that is selected from the group consisting of the C2 position, the N3 position, the C6 position, and combinations thereof, or is covalently attached to BASE at a position when BASE is a purine that is selected from the group consisting of the N1 position, the C2 position, the N3 position, the C6 position, the N7 position, and combinations thereof. --

-- 560. (NEW) The process according to claim 348, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position selected from the group consisting of the N^4 position when said pyrimidine comprises cytosine, the N^2 position when said purine comprises adenine or deazaadenine, the N^6 position when said purine comprises guanine or deazaguanine, and combinations thereof. --

-- 561. (NEW) The process according to claim 522, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least three carbon atoms and at least one double bond. --

-- 562. (NEW) The process according to claim 522, wherein said Sig detectable moiety comprises an aliphatic chemical moiety comprising at least four carbon atoms. --

-- 563. (NEW) The process according to claim 522, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least five carbon atoms. --

-- 564. (NEW) The process according to claim 563, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 565. (NEW) The process according to claim 522, wherein said Sig detectable moiety comprises an aromatic or cycloaliphatic group comprising at least six carbon atoms. --

-- 566. (NEW) The process according to claim 565, wherein said aromatic or cycloaliphatic group is fluorescent or chemiluminescent. --

-- 567. (NEW) The process according to claim 522, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position when BASE is a pyrimidine that is selected from the group consisting of the C2 position, the N3 position, the C6 position, and combinations thereof, or is covalently attached to BASE at a position when BASE is a purine that is selected from the group consisting of the N1 position, the C2 position, the N3 position, the C6 position, the N7 position, and combinations thereof. --

-- 568. (NEW) The process according to claim 522, wherein said Sig detectable moiety in said nucleotide (i) is covalently attached to said BASE at a position selected from the group consisting of the N^4 position when said pyrimidine comprises cytosine, the N^2 position when said purine comprises adenine or deazaadenine, the N^6 position when said purine comprises guanine or deazaguanine, and combinations thereof. --

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